REMARKS

The present Amendment cancels claims 34-37 and adds new claims 38 and 39. Therefore, the present application has pending claims 38 and 39.

35 U.S.C. §103 Rejections

Claims 34-37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,823,310 to Grand in view of U.S. Patent No. 5,748,952 to Chadha, et al. ("Chadha"). As indicated above, claims 34-37 were canceled. Therefore, this rejection regarding claims 34-37 is rendered moot.

New Claims 38 and 39

Claims 38 and 39 were added to more clearly describe features of the present invention. Specifically, claims 38 and 39 were added to more clearly recite that the present invention is directed to a database management method for managing data in a database for magnetic heads as recited, for example, in independent claim 38. The features of claims 38 and 39 are fully supported by the specification, for example, at page 10, line 7 to page 14, line 4; page 14, line 21 to page 16, line 24; page 17, line 7 to page 18, line 16; page 18, line 21 to page 20, line 12; and Figs. 2, 4-8, and 10-13.

The present invention, as recited in claim 38, provides a database management method for managing data in a database for magnetic heads, including a step of inputting and dividing data. The data arrives in a sequence of a time series and is divided into segments of a predetermined size. The segments, together with bookmark information, are stored in a data area of a storage of the database. Each of the bookmark information of a segment includes time information and status information, where the time information is read out of a clock included in the

database, and where status information of loading is written into a currently storing segment during the storing, thereby to make the currently storing segment inaccessible. Thereafter, status information indicating an online state is written to make a stored segment accessible. The method also includes a step of storing a segment having time information of null and status information of empty into a position next to a last segment of the segments stored in the data area. Another step includes setting, in a system definition information area of the storage, storage location management information having start segment information that points to a start segment of the segments and empty segment information that points to said segment having said time information of null and said status information of empty stored in the data area. Yet another step of the present invention includes reading, in response to receiving further data, which arrives in sequence of time series following the data divided, empty segment information out of the system definition information are to point to a segment and divide the further data into segments and store the segments into the data area starting from the segment pointed to. Status information of loading is written into a currently storing segment during the storing to make the currently storing segment inaccessible. Thereafter, status information indicating an online status is written to make a stored segment accessible. The method of the present invention further includes a step of storing a segment of the further data having time information of null and status information of empty into a position next to a last segment of said segments of said further data stored in the data area. The method also includes setting, in a system definition information area of the storage, empty segment information that points to the segment of the further

data having the time information of null and the status information of empty stored in the data area. Furthermore, the method includes acquiring, when a deletion operation of one or a plurality of segments have certain time information, time information from the bookmark information of the segments having status information indicating an online status stored in the data area of the storage to decide whether the one or a plurality of segments are ones that are to be deleted. If the result of this decision is yes, then the method shifts start segment information in the system definition information area, if any, to a next segment in time series fashion, and sets time information of null and status information of empty into the bookmark information area of the one or a plurality of segments. The prior art does not disclose all of the above described features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record. Specifically, the features are not taught or suggested by either Grand or Chadha, whether taken individually or in combination with each other.

Grand teaches a device for enabling concurrent access of indexed sequential data files. However, there is no teaching or suggestion in Grand of the database management method for managing data in a database for magnetic heads as recited in claim 38 of the present invention.

Grand discloses where an indexed sequential file is made accessible for random or sequential reading of records while allowing concurrent modification to the file. Each ordered group of records in the file is associated with timestamps referencing a deletion time of the group and the time that the group was last

modified. During a current search in a group for a desired record, the timestamp referencing a deletion time of the group is compared to a search time established at the beginning of the search. For sequential reading, the timestamp referencing a last modification time of a group containing the desired record is compared to a respective timestamp corresponding to the reading of the preceding record. The comparisons provide indication of whether the group to which the desired record belongs is currently the group to be searched. The most recently modified and deleted groups are stored in a cache memory. When the cache memory is full, an incoming group and respective timestamps replaces the least recent or least likely to be used group and respective timestamps. The most recent timestamps of the replaced groups' timestamps are saved in local memory and are used in the comparisons for groups not currently in the cache.

One feature of the present invention, as recited in claim 38, includes a step of inputting and dividing data. The data arrives in a sequence of a time series and is divided into segments of a predetermined size. The segments, together with bookmark information, are stored in a data area of a storage of the database. Each of the bookmark information of a segment includes time information and status information, where the time information is read out of a clock included in the database, and where status information of loading is written into a currently storing segment during the storing, thereby to make the currently storing segment inaccessible. Thereafter, status information indicating an online state is written to make a stored segment accessible. Grand does not disclose this feature.

Another feature of the present invention, as recited in claim 38, includes reading, in response to receiving further data, which arrives in sequence of time series following the data divided, empty segment information out of the system definition information are to point to a segment and divide the further data into segments and store the segments into the data area starting from the segment pointed to. Status information of loading is written into a currently storing segment during the storing to make the currently storing segment inaccessible. Thereafter, status information indicating an online status is written to make a stored segment accessible. Grand does not disclose this feature.

Yet another feature of the present invention, as recited in claim 38, includes acquiring, when a deletion operation of one or a plurality of segments have certain time information, time information from the bookmark information of the segments having status information indicating an online status stored in the data area of the storage to decide whether the one or a plurality of segments are ones that are to be deleted. If the result of this decision is yes, then the method shifts start segment information in the system definition information area, if any, to a next segment in time series fashion, and sets time information of null and status information of empty into the bookmark information area of the one or a plurality of segments. Grand does not disclose this feature.

Therefore, Grand fails to teach or suggest "inputting and dividing data, which arrive in sequence of time series, into segments of a predetermined size, and storing said segments together with bookmark information in a data area of a storage of said database, each of said bookmark information of a segment including time

information and status information, wherein said time information is read out of a clock included in said database and wherein status information of loading is written into a currently storing segment during the storing thereby to make the currently storing segment inaccessible, thereafter status information indicating an online status is written thereby to make a stored segment accessible" as recited in claim 38.

Furthermore, Grand fails to teach or suggest "reading, in response to receiving further data which arrive in sequence of time series following said data divided, empty segment information out of said system definition information area thereby to point to a segment and divide said further data into segments and store the segments into said data area starting from said segment pointed to, wherein status information of loading is written into a currently storing segment during the storing thereby to make the currently storing segment inaccessible, thereafter status information indicating an online status is written thereby to make a stored segment accessible" as recited in claim 38.

Even further, Grand fails to teach or suggest "acquiring, when a deletion operation of one or a plurality of segments having certain time information, time information out of said bookmark information of the segments having status information indicating an online status stored in said data area of said storage to decide whether said one or a plurality of segments are ones which are to be deleted, and if this decision is yes, shifting start segment information in said system definition information area, if any, to a next segment in time series fashion and setting time information of null and status information of empty into the bookmark information area of said one or a plurality of segments" as recited in claim 38.

The above noted deficiencies of Grand are not supplied by any of the other references of record, namely Chadha, whether taken individually or in combination with each other. Therefore, combining the teachings of Grand and Chadha still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Chadha teaches a system and method for avoiding complete index tree traversals in sequential and almost sequential index probes. However, there is no teaching or suggestion in Chadha of the database management method for managing data in a database for magnetic heads as recited in claim 38 of the present invention.

Chadha discloses a system and method for using the proximity of keys in sequential or near sequential index probes to avoid complete index tree traversal. Page information from there pages (i.e., LAST, PARENT and NEXT) are stored in separate information fields within an index lookaside buffer. The LAST information field contains information on the most recent leaf page accessed during an index probe in a read key or an insert key operation. The PARENT information field contains information on the parent page of the most recently accessed leaf page described in the LAST information field. The NEXT information field contains information on the most recent leaf page accessed during a fetch-next key or delete key operation. On a subsequent index probe, the LAST, NEXT and PARENT information fields are sequentially analyzed to determine if the search key is contained within the leaf page described by the LAST or NEXT information fields or if the search key is contained within one of the leaf pages pointed to by the parent

page described by the PARENT information field. If none of the LAST, NEXT or PARENT information fields identifies the leaf page containing the search key, then the default root-to-leaf traversal would commence.

One feature of the present invention, as recited in claim 38, includes a step of inputting and dividing data. The data arrives in a sequence of a time series and is divided into segments of a predetermined size. The segments, together with bookmark information, are stored in a data area of a storage of the database. Each of the bookmark information of a segment includes time information and status information, where the time information is read out of a clock included in the database, and where status information of loading is written into a currently storing segment during the storing, thereby to make the currently storing segment inaccessible. Thereafter, status information indicating an online state is written to make a stored segment accessible. Chadha does not disclose this feature.

Another feature of the present invention, as recited in claim 38, includes reading, in response to receiving further data, which arrives in sequence of time series following the data divided, empty segment information out of the system definition information are to point to a segment and divide the further data into segments and store the segments into the data area starting from the segment pointed to. Status information of loading is written into a currently storing segment during the storing to make the currently storing segment inaccessible. Thereafter, status information indicating an online status is written to make a stored segment accessible. Chadha does not disclose this feature.

Yet another feature of the present invention, as recited in claim 38, includes acquiring, when a deletion operation of one or a plurality of segments have certain time information, time information from the bookmark information of the segments having status information indicating an online status stored in the data area of the storage to decide whether the one or a plurality of segments are ones that are to be deleted. If the result of this decision is yes, then the method shifts start segment information in the system definition information area, if any, to a next segment in time series fashion, and sets time information of null and status information of empty into the bookmark information area of the one or a plurality of segments. Chadha does not disclose this feature.

Therefore, Chadha fails to teach or suggest "inputting and dividing data, which arrive in sequence of time series, into segments of a predetermined size, and storing said segments together with bookmark information in a data area of a storage of said database, each of said bookmark information of a segment including time information and status information, wherein said time information is read out of a clock included in said database and wherein status information of loading is written into a currently storing segment during the storing thereby to make the currently storing segment inaccessible, thereafter status information indicating an online status is written thereby to make a stored segment accessible" as recited in claim 38.

Furthermore, Chadha fails to teach or suggest "reading, in response to receiving further data which arrive in sequence of time series following said data divided, empty segment information out of said system definition information area thereby to point to a segment and divide said further data into segments and store

the segments into said data area starting from said segment pointed to, wherein status information of loading is written into a currently storing segment during the storing thereby to make the currently storing segment inaccessible, thereafter status information indicating an online status is written thereby to make a stored segment accessible" as recited in claim 38.

Even further, Chadha fails to teach or suggest "acquiring, when a deletion operation of one or a plurality of segments having certain time information, time information out of said bookmark information of the segments having status information indicating an online status stored in said data area of said storage to decide whether said one or a plurality of segments are ones which are to be deleted, and if this decision is yes, shifting start segment information in said system definition information area, if any, to a next segment in time series fashion and setting time information of null and status information of empty into the bookmark information area of said one or a plurality of segments" as recited in claim 38.

Both Grand and Chadha suffer from the same deficiencies relative to the features of the present invention, as recited in the claims. Therefore, combining the teachings of Grand and Chadha does not render obvious the features of the present invention as now more clearly recited in the claims.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to Grand and Chadha.

In view of the foregoing amendments and remarks, applicants submit that claims 38 and 39 are in condition for allowance. Accordingly, early allowance of claims 38 and 39 is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 500.36133CC2).

Respectfully submitted,

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